

Amendments to the Drawings

The attached replacement sheet(s) of drawings replace(s) the sheets with the corresponding figures. The replacement sheets include the following changes:

In Fig. 39 the lead line for reference numeral 504 has been corrected to point to the first electrode at two places. An extra copy of the drawing sheet containing Fig. 39 with the changes boldly circled is provided for the Examiner's convenience.

Remarks

This is responsive to the Office Action mailed March 7, 2005. An extension of time for two months is filed herewith. The fee for that extension is paid herewith by credit card.

A minor revision has been made to specification page 51.

A minor revision has been made to Fig. 39.

Claims 7, 8, 10, 13, 17, 18, 19 and 25 have been amended herein.

The application includes claims 1-103. Claims 1-6 and 26-103 have been withdrawn from consideration in view of the prior restriction requirement.

As is described and claimed in the patent application, a first electrode has a number of discharge sites that can discharge into a fluid. A number of examples are presented in the specification for obtaining the plural discharge sites. In one sense the discharge sites may act as discontinuities in the first electrode wire whereby each acts substantially independently of the others during discharging. The discharge sites may be provided by respective portions of a wire (the first electrode) that are physically closer to a counter electrode than are other portions of the wire. As current flows along the wire, electrons tend to congregate at those "closer" portions (discharge sites) of the wire due at least in part to the electric field that is established between the wire and the counter electrode. When sufficient charge has accumulated at a discharge site, there is a discharge into the fluid. The discharge that occurs at one discharge site does not necessarily affect the discharge that would occur at another discharge site, and, therefore, the discharge sites in effect discharge in parallel although they charge in series as current flows through the electrode, e.g., the wire. These characteristics of operation are achieved, for example, using the claimed electrical discharge device.

Withdrawal of the rejection of claims 8-12, 17 and 18 under 35 U.S.C. 112, first paragraph, respectfully is requested. It is believed that the amendments made to the claims 8, 10, 17 and 18 clarify the claimed recitations. Moreover, the specification does describe that the first electrode can be a plurality of input electrodes; see for example, specification page 43, the paragraph beginning at about line 12, and also see the illustrations in Figs. 39 and 40, for example. Furthermore, at the same place in the specification a pair of counter electrodes 505 is mentioned. In the drawings, at Fig. 39 the lead lines for reference numeral 504 have been corrected to point to the plurality of input electrodes. The pair of counter electrodes is illustrated at 505 in Fig. 39. Furthermore, in Fig. 48 openings 802 cut in the wrapped counter electrode 505, which are described in the specification in the paragraph bridging pages 50-51, provide discontinuities in the counter electrode so that they appear as separate respective electrodes from an electrical perspective, as is described at pages 50-51 of the specification.

For at least these reasons the rejection under 35 U.S.C. 112, first paragraph, should be withdrawn.

Withdrawal of the rejection of claims 13, 17 and 18 under 35 U.S.C. 112, second paragraph, as being indefinite, respectfully is requested for the following reasons. Claim 13 has been amended to be point out that the path referred to is the "charging path." Claims 17 and 18 also have been amended, and it is believed that these claims now meet the requirements of 35 U.S.C. 112, second paragraph.

Accordingly, the rejection of claims 13, 17 and 18 under 35 U.S.C. 112, second paragraph should be withdrawn.

If there are any questions regarding the amendments to the claims and/or the requirements of 35 U.S.C. 112, as that section pertains to the claims, applicant's undersigned attorney would be glad to discuss the same with the patent examiner.

Turning to the rejection of claims 7-15 and 20-25 under 35 U.S.C. 102(b) as being clearly anticipated by Bell et al (5, 516,493), withdrawal of that rejection respectfully is requested for the following reasons.

Claim 7 points out an electrical discharge device to ionize a fluid. The electrical discharge device includes a first electrode having a number of discharge sites to discharge electrically into the fluid. The electrodes in the Bell device do not discharge into the fluid. Rather, the electrodes 60, 20 of the Bell device are on opposite sides of respective dielectric tubes relative to a space 12 where fluid flows, and they induce a corona discharge in the gas, but the electrodes do not discharge into the gas.

Claim 7 also points out that the discharge sites and the charging path to the discharge sites are related for charging the discharge sites in series and discharging the discharge sites in parallel. Bell does not disclose this claimed limitation.

Further to the above comments concerning the distinctions of claims 7-15 and 20-25 over Bell, please note the following:

As for claim 8, Bell does not disclose a plurality of input electrodes and a pair of counter electrodes.

As for claims 13-15, Bell does not disclose a holder or the manner in which the holder is used and related to the first electrode.

As for claims 21-24, Bell does not disclose an electrode being located in a tube off center from the tube axis. Such off center relation allows portions of the first electrode to be relatively closer to the counter electrode(s) than other portions of the first electrode so that a number of discharge sites are obtained.

As for claim 24, Bell does not disclose a counter electrode (or further electrode) that has discontinuities in it to cause discontinuity in electric field.

As for claim 25, which has been amended, Bell does not disclose the counter electrode and its co-operation with the first electrode or the off center relation of the first electrode relative to the counter electrode to define respective discharge sites.

For at least these reasons the subject matter of claims 7-15 and 20-25 is not clearly anticipated by Bell, and the rejection of those claims under 35 U.S.C. 102(b) should be withdrawn.

Withdrawal of the rejection of claims 7, 13-15, 21 and 22 under 35 U.S.C. 102(b) as being clearly anticipated by Rodden (6,139,809) respectfully is requested. Rodden has an outer tubular casing 32 of stainless steel, which serves as a tubular electrode, an inner dielectric glass tube 34 and an inner tubular electrode 38, which may be a solid integral structure, a conductive surface on the dielectric tube 34 or a stainless steel mesh. In operation, which is described at column 4 of Rodden, for example, air flows through the discharge zone 40. The flow is in the area of the tubular electrode 32; if there is an electrical discharge into the air, that discharge would be from the tubular electrode 32. The tubular electrode 32 is a smooth tube; it does not have a number of discharge sites that charge in series and discharge in parallel, e.g., as is set forth in the rejected claims. Rather, Rodden is a type of device that has been used for many years to create ozone, i.e., a device that has a large surface electrode (the tubular electrode 32); such prior devices suffered from hot spots and failures due to heat and burnout from the discharges occurring from points on the large surface, and Rodden is likely to suffer from the same disadvantage as the prior devices. The present invention as claimed in the rejected claims, though, having a first electrode with a number of discharge sites and a relation such that the discharge sites charge in series and discharge in parallel, provides for intended discharging from a number of discharge sites and avoids the hot spot problem of the prior art; Rodden does not disclose or suggest this feature.

Additionally with respect to claims 13-15, Rodden does not disclose a holder to hold the first electrode to maintain its shape; the first electrode in Rodden is a stainless steel cylinder 32. Rodden also does not disclose the first electrode being wrapped around the holder. The end caps 42, 44 of Rodden are not wrapped around the stainless steel cylinder 32.

As for claims 21 and 22, Rodden does not disclose the claimed subject matter. The "first electrode" of Rodden would be the stainless steel cylinder 32, not the electrode 38; that stainless steel cylinder is not located in a tube off center from the tube axis. Even if the electrode 38 of Rodden were thought to be a "first electrode" as is set forth in claims 21 and 22, that electrode 38 does not discharge into fluid in the tube 34; rather the discharge zone is at 40—therefore, the electrode 38 is not the same as the claimed first electrode in claims 7, 13-15, 21 and 22.

For at least the above reasons the subject matter of claims 7, 13-15, 21 and 22 is not clearly anticipated by Rodden under 35 U.S.C. 102(b), and such rejection should be withdrawn.

Withdrawal of the rejection of claims 16-18 under 35 U.S.C. 103(a) as being unpatentable over Bell respectfully is requested. Claims 16-18 depend indirectly from claim 7 and distinguish over Bell for the reasons expressed above. Claim 16 points out a holder that has a number of protrusions and recesses; the holder holds the first electrode; and the first electrode, as is pointed out in claim 7, discharges electrically into the fluid. The tape 110 of Bell does not hold a first electrode that discharges electrically into the fluid. The electrode 70 of Bell that is held by the tape is outside the tube 60. In contrast, the holder of claims 16-18, for example, holds the first electrode to maintain its shape, and the first electrode has a number of discharge sites that discharge in parallel and charge in series. Bell does not disclose or suggest these features. Bell also does not disclose a dielectric tube having an interior wall and the holder and first electrode being within the dielectric tube—rather, as was mentioned above, the tape 110 of Bell holds the windings of the electrode 70 to the outside of the tube 60.

For at least the above reasons, the subject matter of claims 16-18 would not be unpatentable under 35 U.S.C. 103(a) over Bell, and this rejection should be withdrawn.

Withdrawal of the rejection of claim 19 under 35 U.S.C. 103(a) as being unpatentable over Bell in view of Rodden respectfully is requested. Claim 19 depends from claim 7 and distinguishes from both Bell and Rodden for the reasons expressed above with respect to claim 7. The first electrode that is pointed out in claim 7 and, therefore, in claim 19, is the electrode that has a number of discharge sites that discharge into a fluid in parallel and charge in series. The mesh electrode 38 of Rodden does not discharge into the fluid; it is not the same as the first electrode claimed in claim 19. Furthermore, in Bell there is no first electrode that has a number of discharge sites to discharge electrically into the fluid, and in Bell there also is no disclosure of discharge sites that charge in series and discharge in parallel. Rather, in Bell, there is no electrode that discharges into a fluid; both electrodes 30 and 70 of Bell are outside the zone where oxygen flows between two concentric tubes 20, 60. Therefore, even if a mesh electrode 38 of Rodden were substituted for one of the electrodes of Bell, the result would not provide a mesh electrode that has a number of discharge sites that discharge in parallel into a fluid and charge in series.

For at least the above reasons the subject matter of claim 19 would not be unpatentable over Bell in view of Rodden under 35 U.S.C. 103(a), and this rejection should be withdrawn.

For at least the above reasons all claims are patentable over the applied references and should be allowable. Accordingly, this application is believed to be in condition for allowance.

If there are any questions or if Examiner Mayekar feels that a telephone interview would be helpful to expedite favorable prosecution of this application, he is invited to phone applicant's undersigned attorney at the number below.

Respectfully submitted,

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